

DANIEL W. BAKER, PH.D., P.E.

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EDUCATION

- Ph.D. Colorado State University, Fort Collins, CO, 2009 3.97 / 4.00 GPA
Civil and Environmental Engineering – River Mechanics and Stream Restoration
- M.S. Montana State University, Bozeman, MT, 2001 3.77 / 4.00 GPA
Department of Civil and Environmental Engineering – Transportation and Hydraulics
- B.S. Montana State University, Bozeman, MT, 1999 3.50 / 4.00 GPA
Department of Civil and Environmental Engineering – Graduated with Honors
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ACADEMIC EXPERIENCE

RESEARCH SCIENTIST

AUGUST 2012 - PRESENT

Department of Civil & Environmental Engineering
Colorado State University – Fort Collins, CO

RESEARCH

- Project design team for *Web-Based Guidance and Toolbox for Urban Stream Systems* with U.S. Army Corps of Engineers - Engineer Research and Development Center in Vicksburg, MS
- Member of design team and coordinating Bayesian modeling for *Ecological Response Model for the Fort Collins Reach of the Cache la Poudre River*
- PI for *Cache la Poudre River Post-Fire Sediment & Aquatic Insect Monitoring* in Fort Collins, CO
- *National Riparian Protocol Geomorphic Valley Classification Tool upgrade* (project started in my postdoc at CSU) and production of valley classification map data product for the western US

TEACHING:

- Teaching *CIVE 260 Engineering Mechanics-Statics* (SP 2013, FA 2013, SP 2014, & FA 2014)
- Invited lecturer for *CIVE 330 Ecological Engineering*, *CIVE 613 Stream Rehabilitation Design*, *NR420 Integrated Ecosystem Management*, and *NR479 Ecological Restoration Case Studies*

POSTDOCTORAL FELLOW

APRIL 2010 – JULY 2012

Department of Geography & Environmental Engineering
Johns Hopkins University - Baltimore, MD

RESEARCH

- Stream Restoration Program Manager for the National Center for Earth-surface Dynamics (NCED) based at the University of Minnesota – Minneapolis, MN
- Program manager for *The Stream Project: Decision Analysis and Design Guidance for Stream Restoration* in partnership with NCED, U.S. Army Corps of Engineers, and the Intermountain Center for River Rehabilitation and Restoration in Logan, UT
- Led research team examining multiple spatial scales of NO₃ uptake in the Outdoor Stream Lab at the St. Anthony Falls Laboratory at the University of Minnesota in Minneapolis, MN

TEACHING:

- Invited lecturer *575.730 Geomorphologic and Ecologic Foundations of Stream Restoration* and *570.403 Ecology*

INSTRUCTOR AND COURSE DEVELOPER

SEPT 2010 – PRESENT

Engineering for Professionals – Whiting School of Engineering
Johns Hopkins University - Elkridge, MD

TEACHING:

- Co-developed online course *575.730 Geomorphologic and Ecologic Foundations of Stream Restoration* with Prof. Peter Wilcock in accordance with Quality Matters online course guidelines
- Course delivered in Spring 2011, 2012, 2014, 2015, and 2016

POSTDOCTORAL RESEARCHER AND INSTRUCTOR

JULY 2009 – MAR 2010

Department of Civil and Environmental Engineering
Colorado State University – Fort Collins, Colorado

RESEARCH:

- Developed monitoring protocol for urbanizing stream basins in southern California as part of the Southern California Coastal Water Research Project (SCCWRP)
- Co-built GIS valley classification algorithm using Python code and lead author on Sampling Design chapter for USFS *Riparian Monitoring Technical Guide for the Western US*
- GIS analysis for EPA Environmental Monitoring and Assessment Program (EMAP) sites
- Analysis of the current condition and impacts of reservoir expansion on the North Fork of the Cache la Poudre River for The Nature Conservancy

TEACHING:

- Instructed graduate level *CIVE 521 Hydrometry* covering the principles, methods, and instruments for measuring water quantity and water quality in natural aquatic systems
- Invited lecturer for *CIVE 413 Environmental River Mechanics*

PH.D. / GRADUATE RESEARCH ASSISTANT

JUN 2005 – JULY 2009

Department of Civil and Environmental Engineering
Colorado State University – Fort Collins, Colorado

RESEARCH:

- Examined the ecological, geomorphic, and physical effects of diversion dams on mountain streams in project funded by the EPA
- NSF funded research quantifying stream geomorphic complexity as it relates to the transient storage within agricultural and urban streams

TEACHING:

- Taught *CIVE 261 Engineering Mechanics: Dynamics* during the 8-week summer 2008 session
- Invited lecturer for senior level *CIVE 413 Environmental River Mechanics*
- Obtained *Certificate in College Teaching* through The Institute of Teaching and Learning

MASTER OF SCIENCE / GRADUATE RESEARCH ASSISTANT

JAN 2000 – MAY 2001

Department of Civil Engineering
Montana State University - Bozeman, Montana

RESEARCH:

- Funded by graduate research fellowship through the Western Transportation Institute
- Developed *Culvert Qualitative Rating System* for Montana Department of Transportation

CONSULTING

WATER LOGIC, LLC
Owner and Sole Proprietor

MAY 2014 – PRESENT

Scientific consulting firm specializing in the assessment, planning, and modeling of aquatic systems

CONTRACTS

- 2014 – City of Fort Collins Natural Areas – Ecosystem Response Model
- 2015 – City of Fort Collins Natural Areas – River Health Framework
- 2015 – Expert witness services

COURSES TAUGHT

UNIVERSITY COURSES

<u>Course</u> ¹	<u>Semester</u>	<u>Delivery</u>	<u>Students</u>	<u>Overall Rating</u> ²
CSU - CIVE 261 Dynamics	Summer 2008	Classroom	21	4.42
CSU - CIVE 521 Hydrometry	Fall 2009	Classroom	5	4.40
JHU - 575_730_81 Stream Restoration	Spring 2011	Online	18	4.65 ³
JHU - 575_730_81 Stream Restoration	Spring 2012	Online	18	4.30
CSU - CIVE 260 Statics	Spring 2013	Classroom	47	4.89
CSU - CIVE 260 Statics (2 sections = 1 on-campus + 1 online)	Fall 2013	Classroom & Online	95	4.76
CSU - CIVE 260 Statics	Spring 2014	Classroom	66	4.76
JHU - 575_730_81 Stream Restoration	Spring 2014	Online	18	4.30
CSU - CIVE 260 Statics (3 sections = 2 on-campus + 1 online)	Fall 2014	Classroom & Online	245	4.65
CSU - CIVE 260 Statics	Spring 2015	Classroom	135	4.47
CSU - CIVE 260 Statics (3 sections = 2 on-campus + 1 online)	Fall 2015	Classroom & Online	236	4.81
CSU - CIVE 261 Dynamics	Fall 2015	Classroom	123	4.51
CSU - CIVE 260 Statics	Spring 2016	Classroom	TBD	TBD
CSU - CIVE 261 Dynamics (3 sections = 2 on-campus + 1 online)	Spring 2016	Classroom & Online	TBD	TBD

¹ Colorado State University (CSU), Johns Hopkins University (JHU)

² On a 1-5 scale related to overall rating of instructor by the students as part of the final course evaluation

³ Scaled from 1-4 scale (3.7/4.0 average across all indicators)

NON-UNIVERSITY COURSES

STREAM PROJECT: HALF-DAY SHORTCOURSE INSTRUCTOR 2011-2012

Deliver Stream Project introduction and training to restoration practitioners at regional and national conferences including:

- Mid-Atlantic Stream Restoration Conference, Flintstone, MD – Nov 2011
- River Restoration Northwest, Stevenson, WA – Jan 2012
- Upper Midwest Stream Restoration Symposium, Oconomowoc, WI – Feb 2012
- World Environmental & Water Resources Congress (EWRI-ASCE), Albuquerque, NM – May 2012
- Stream Restoration in the Southeast, Wilmington, NC – Nov 2012

SAGEHEN RIVER RESTORATION SHORTCOURSE: PRINCIPAL INSTRUCTOR SUMMER 2010

Lake Tahoe, California

- Alternate course title: *Geomorphic and Ecological Fundamentals for River and Stream Restoration*
- Lectured on the relationship between water quality improvement and stream restoration
- Participated in classroom and field group exercises and discussions

RESEARCH PROJECTS - FUNDED

PRINCIPAL INVESTIGATOR

- \$191,690 (FY 2016-2020) The United States Department of the Interior National Park Service, *Answering Ecological Management Questions for Aquatic Resources in National Parks using GIS and Remote Sensing Tools*
- \$20,000 (FY 2016) U.S. Army Corps of Engineers, Engineer Research and Development Center, *Web-Based tools to inform fish passage and environmental flow decisions.*
- \$49,000 (FY 2014-2015). Forest Service, National Stream and Aquatic Ecology Center, *National Riparian Protocol Geomorphic Valley Classification Tool upgrade and production of valley classification map data product for the western US*
- \$50,644 (FY 2015) U.S. Army Corps of Engineers, Engineer Research and Development Center, *Cooperative Agreement Extension #2: Web-Based Guidance and Toolbox for Urban Stream Systems*
- \$79,873 (FY 2014) U.S. Army Corps of Engineers, Engineer Research and Development Center, *Cooperative Agreement Extension #1: Web-Based Guidance and Toolbox for Urban Stream Systems*
- \$29,947 (FY 2013) City of Fort Collins, Natural Area's Program, *Ecological Response Model for the Fort Collins Reach of the Cache la Poudre River: Phase 1b*
- \$82,706 (FY 2012-2013) U.S. Army Corps of Engineers, Engineer Research and Development Center, *Web-Based Guidance and Toolbox for Urban Stream Systems*
- \$7,000 (FY 2012-2013) Bohemian Foundation via City of Fort Collins, Utilities and Natural Area's Program, *Cache la Poudre River Post-Fire Sediment & Aquatic Insect Monitoring*
- \$21,000 (FY 2012-2013) City of Fort Collins, Utilities and Natural Area's Program, *Cache la Poudre River Post-Fire Sediment & Aquatic Insect Monitoring: CFC*

- \$9,975 (FY 2012) City of Fort Collins, Natural Area's Program, *Ecological Response Model for the Fort Collins Reach of the Cache la Poudre River: Phase 1a*

CO-PRINCIPAL INVESTIGATOR

- \$121,170 (2015-2020) Colorado Parks and Wildlife, *Riparian Vegetation Monitoring on Upper Arkansas River*
- \$350,000 (2013-2016) Transportation Research Board – National Cooperative Highway Research Program, *Design Hydrology for Stream Restoration and Channel Stability at Stream Crossings* with B. Bledsoe and P. Nelson
- \$16,000 (2012-2014) Colorado Parks and Wildlife, City of Fort Collins, Natural Area's Program, *Cache la Poudre River Post-Fire Sediment & Aquatic Insect Monitoring: CPW* with B. Bledsoe

CO-INVESTIGATOR

- \$12,000,000 (2015-2019) National Science Foundation (NSF) *Urban Water Sustainability Research Network (SRN)* with M. Arabi, B. Bledsoe, N. Grigg, J. Ramirez, and S. Sharvelle
- \$2,499,995 (2013-2017) Environmental Protection Agency (EPA) *Center for Comprehensive, optimal, and Effective Abatement of Nutrients (CLEAN)* with M. Arabi, S. Sharvelle, B. Bledsoe, D. Hoag, W. Hunt, D. Osmond, J. Vrgut, and J. Silverstein

PUBLICATIONS

PEER REVIEWED

- Mueller Price, J., B. P. Bledsoe and D. W. Baker. 2015. Influences of Sudden Changes in Discharge and Physical Stream Characteristics on Transient Storage and Nitrate Uptake in an Urban Stream. *Hydrological Process*. 29(6), 1466-79 pp. doi: 10.1002/hyp.10275
- Niezgoda, S. L., P. R. Wilcock, D. W. Baker, J. M. Price, J. M. Castro, J. C. C. T. Wynn-Thompson, J. S. Schwartz and F. D. Shields, Jr. 2014. Defining a stream restoration body of knowledge as a basis for national certification. *Journal of Hydraulic Engineering, Journal of Hydraulic Engineering*. 140(2), 123-36. doi: 10.1061/(ASCE)HY.1943-7900.0000814
- Baker, D. W., B. P. Bledsoe and J. Mueller Price. 2012. Nitrate uptake and transient storage over a gradient of geomorphic complexity, north-central Colorado, USA. *Hydrological Processes* 26:3241-52. doi: 10.1002/hyp.8385.
- Laub, B. G., Baker., D. W., Palmer, M. A. and Bledsoe, B. P. 2012. Range of variability of channel complexity in urban, restored and forested reference streams. *Freshwater Biology* 57(5), 1076–1095. doi:10.1111/j.1365-2427.2012.02763.x.
- Baker, D. W., B. P. Bledsoe, C. M. Albano and N. L. Poff, 2011. Downstream effects of diversion dams on sediment and hydraulic conditions of Rocky Mountain streams. *River Research and Applications* 27(3), 388–401. doi: 10.1002/rra.1376
- Cahoon, J., D. W. Baker and J. Carson, 2002. Factors for rating the condition of culverts for repair or replacement needs. *Transportation Research Record No. 1814, Design of Structures: 197-202.*

MANUSCRIPTS IN PREPARATION

- Mueller Price, J., B. P. Bledsoe and D. W. Baker. *In press*. Effects of passive and structural stream restoration approaches on transient storage and nitrate uptake. *River Research and Applications*
- Bledsoe, B. P., D. W. Baker, K. Bestgen, N. L. Poff, and J. Shanahan. *In prep*. Ecological Response Model for the Cache la Poudre River, Colorado. *Ecological Applications*
- Baker, D. W., B. P. Bledsoe, and E. A. Carlson. *In prep*. Design and implementation of a hydrogeomorphic valley classification tool applied to rivers in the Western US. *River Research and Applications*.
- Mueller Price, J., B. P. Bledsoe and D. W. Baker *In prep*. Comparing transient storage and nitrate uptake among two restoration approaches in Colorado headwater streams. *River Research and Applications*.

OTHER PUBLICATIONS

- Bledsoe, B. P., Sholtes, J. A., and Baker, D. W. *In prep*. Wetland and River Restoration, In *Handbook of Applied Hydrology*. Singh, V. P (ed) McGraw-Hill, New York.
- Baker, D. W., 2009. Land use effects on physical habitat and nitrate uptake in small streams of the central rocky mountain region. Ph.D. Dissertation. Department of Civil and Environmental Engineering. Colorado State University, Fort Collins, CO.
- Baker, D. W., 2001. Rating system for rural culvert crossing repair and maintenance. M.S. Thesis. Department of Civil Engineering. Montana State University, Bozeman, MT.
- Baker, D. W. and B. P. Bledsoe, *In-prep*. Project-Level Monitoring and Probabilistic Sampling and Study Design. In *Riparian Monitoring Technical Guide for the Western US*. USDA National Forest Service Riparian Technical Team (eds) U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fort Collins, CO.

PRESENTATIONS

INVITED SPEAKER

- Baker, D. W. 2013. What happens downstream? A discussion of impacts to aquatic biota after the fires. Big Thompson Watershed Forum - 13th Watershed Conference. Greeley, CO.
- Baker, D. W. 2013. Was the flood good, bad, or ugly for the health of the Poudre? Poudre Runs Through It Study/Action Work Group. Fort Collins, CO.

LEAD AUTHOR (RECENT)

- Baker, D. W., T. C. Wible, M. Arabi, C. J. Fischenich. 2015. A Perfect Cloud-Based Marriage: Web-Served Data and River Analysis Tools on the eRAMS Platform. American Society of Civil Engineers, World Environmental & Water Resources Congress, Austin, TX.
- Baker, D. W. and S. K. Adams. 2015. When do we need a snorkel? Practical lessons learned on monitoring cobble-bed rivers often barely-wadeable at low flows. American Geophysical Union - Hydrology Days, Fort Collins, CO.

- Baker, D. W. 2014. Informing River Management Decisions on the Front Range of Colorado: Testing Potential Mitigation Scenarios with a Bayesian Ecological Response Model. American Society of Civil Engineers, World Environmental & Water Resources Congress, Portland, OR.
- Baker, D. W., 2014 The 2012 Fires and 2013 Floods: A knockout combination for the main stem of the Poudre River or business as usual? American Geophysical Union - Hydrology Days, Fort Collins, CO.
- Baker, D. W. 2013. Using a Bayesian Ecosystem Restoration Model to Make River Management Decisions on the Front Range of Colorado. American Society of Civil Engineers, World Environmental & Water Resources Congress, Cincinnati, OH.
- Baker, D. W. and P. R. Wilcock, 2013. Improving the stream restoration design process with decision analysis, predictive design, and online portals. American Geophysical Union - Hydrology Days, Fort Collins, CO.
- Baker, D. W., B. P. Bledsoe, S. Rathburn, and N. LeRoy Poff. Cache La Poudre River Post-Fire Sediment & Macroinvertebrate Monitoring. 2012 RMHRC Annual Meeting, Fort Collins, CO.
- Baker, D. W. 2012. Stream Project: Decision Analysis and Design Guidance for Stream Restoration. Upper Mid-West Stream Restoration Symposium – Partnership for River Restoration and Science in the Upper Midwest (PRRSUM). Minneapolis, MN.
- Baker, D. W. and P. W. Wilcock. 2011. Evaluating the role of stream restoration in reducing nutrient loading. American Geophysical Union (AGU) - Annual Fall Meeting, San Francisco, CA.
- Baker, D. W., P. W. Wilcock, and B. F. Hobbs. 2011. Incorporating decision analysis and predictive design into stream restoration: The Stream Project. National Conference on Ecosystem Restoration (NCER), Baltimore, MD.
- Baker, D. W. and P. W. Wilcock. 2011. The Stream Project: Decision analysis and design guidance for stream restoration. American Society of Civil Engineers, World Environmental & Water Resources Congress, Palm Springs, CA.
- Baker, D. W., J. Mueller Price and B. P. Bledsoe, 2009. Nutrient Uptake and Transient Storage over a Gradient of Geomorphic Complexity. American Geophysical Union (AGU) - Annual Fall Meeting, San Francisco, CA.

SERVICE & PROFESSIONAL DEVELOPMENT

AWARDS

- 2014 Outstanding Research Scientist/Instructor, Department of Civil & Environmental Engineering, Colorado State University

CERTIFICATIONS

- Passed FE in May 1999 - MT Engineering Intern #13829
- Passed PE in April 2015 – CO #PE.0050113

PROFESSIONAL SERVICE

- CSU College of Engineering Non-Tenure Track Faculty Committee 2016 – Present
- Expert Panel for WERF Stream Restoration BMP Database Module 2015
- CSU Analytics for Learning and Teaching (ALT) Committee Member 2014 – Present
- ASCE-EWRI River Restoration Committee Member 2011 – Present
 - Secretary 2013, Vice-Chair 2014, Chair 2015-2016
- ASCE Task Committee on Stream Restoration Educational Materials 2011 – 2014
- Chesapeake Bay Trust - Restoration Grant Review Team 2012
- Peer reviewer for the journal *Hydrological Processes* 2012 – Present
- Peer reviewer for the journal *Geomorphology* 2011 – Present
- Peer reviewer for the journal *River Research and Applications* 2010 – Present
- Peer reviewer for NSF Postdoctoral Fellowships 2010

SOCIETY MEMBERSHIPS

- American Geophysical Society (AGU) 2006 – Present
- American Society of Civil Engineers (ASCE) 2010 – Present
- American Society for Engineering Education (ASEE) 2014 – Present
- Society for Freshwater Science (SFS)* 2006 – Present
*formerly North American Benthological Society (NABS)
- Society for Ecological Restoration 2012 – 2013
- Institute of Transportation Engineers (ITE) 2000 – 2001

PROFESSIONAL DEVELOPMENT (RECENT)

- Professional Development Institute, Colorado State Univ., 2016
- The Institute for Learning and Teaching (TILT) Summer Conference, Colorado State Univ., 2015
- Professional Development Institute, Colorado State Univ., 2015
- Colorado Flood Recovery Watershed Symposium, Loveland, CO, 2014
- National Science Foundation Grants Conference, Denver, CO, 2014
- Valley Bottom and Riparian Mapping Summit, US Forest Service, Fort Collins, CO, 2014
- Provost's Academy for Instructional Innovation, Colorado State Univ., 2014
- Research Integrity & Compliance Review Faculty Training Series, Colorado State Univ., 2014
- Professional Development Institute, Colorado State Univ., 2014
- The Institute for Learning and Teaching (TILT) Summer Conference, Colorado State Univ., 2013
- Professional Development Institute, Colorado State Univ., 2013
- Google Search and Earth Seminar, Colorado State Univ., 2013
- Symposium on Teaching Excellence, Johns Hopkins Univ., 2012
- Practicum of Higher Education, Johns Hopkins Univ., 2012

NON-ACADEMIA WORK EXPERIENCE

OWNER AND SOLE-PROPRIETOR

MAY 2014 – PRESENT

Water Logic, LLC

Fort Collins, CO

- Environmental consulting specializing in the assessment, planning, and modeling of river systems
- Expert witness services
- Primary client to date has been the City of Fort Collins Natural Areas Department

FINISH CARPENTER

NOV 2004 – JUNE 2005

Rob Lewis & Karl Hanson, General Contractors

Bozeman, Montana

- Designed, milled and installed wooden trim for windows and doors
- Built insulated concrete form (ICF) and structural insulated panel (SIP) buildings

LEAD BOATBUILDER

NOV 2003 – FEB 2004

Darryl's Dinner Cruises

Paihia, New Zealand

- Coordinated construction and built form for *Ratanui*, a 50' dinner-cruise boat
- Designed and built wooden bar, tables and helm station for interior of boat

SHOP FOREMAN

MAR 2001 – AUG 2003

Montana Boatbuilders, Inc.

Livingston, Montana

- Supervised and trained multiple employees in woodworking and composite construction
- Led construction of custom wooden drift and duck boats
- Set up and operated Computer Numerically Controlled (CNC) Router System

TECHNICAL TRAINING INTERN

MAY 1999 – AUG 1999

Finnish National Road Administration

Helsinki, Finland

- Lecture team: *Low Volume Road Technologies and Maintenance* in Estonia, Latvia, and Lithuania
- Participated in development of an EIS for proposed bridge installation
- Compiled and edited multinational report on Asset Management for the Organization for Economic Cooperational Development (OECD)

GEOTECHNIC LAB AND FIELD TECHNICIAN

MAY 1998 – AUG 1998

Harlow & Holman Geotechnical Engineering, LLC

Missoula, Montana

- Performed testing on building and road construction materials in the lab and field
- Specialized in the capture and analysis of concrete samples for the expansion of US-93

COMMUNITY INVOLVEMENT

- Certified League Cycling Instructor (LCI) through the League of American Bicyclists (August 2009 – present)
- Volunteer mechanic at Velocipede Bike Project, Baltimore, MD (April 2011 – June 2012)
- Served as a board member, lead mechanic, and recovered bike coordinator of the Bicycle Cooperative of Fort Collins, a non-profit community bike shop, (Jan 2007-March 2010)
- Co-Chair of the CSU Campus Bike Advisory Committee (Jan 2015 – Present)